

890

CLAIMS

Having described my invention, I claim:

Claim 1. A method for controlling a temperature in a space within a building, comprising:

895

(a) providing a fan control unit having a liquid coil and a fan, with said fan configured to blow air over said liquid coil and into said space;

(b) providing a microchiller including,

(i) a compressor,

(ii) a condenser,

900

(iii) an expansion valve,

(iv) an evaporator, and

(v) a refrigerant circulation loop configured to circulate said refrigerant from said compressor to said condenser, to said expansion valve, to said evaporator, and back to said compressor;

905

(c) providing a primary liquid loop running through said building;

(d) providing a secondary liquid loop running between said microchiller and said fan control unit;

(e) maintaining said primary liquid loop between 18 degrees centigrade and 26 degrees centigrade;

910

(f) providing a first set of valves controlling flow through said evaporator of said microchiller;

(g) providing a second set of valves controlling flow through said condenser of said microchiller;

915

(h) when heating is needed in said space setting said first set of valves to circulate liquid from said primary liquid loop through said evaporator and setting said second set of valves to circulate liquid from said secondary liquid loop through said condenser; and

(i) when heating is needed in said space setting said first set of valves to circulate liquid from said secondary liquid loop through said evaporator and setting said second set of valves to circulate liquid from said primary liquid loop through said condenser.

920

- 925 Claim 2. The method for controlling a temperature in a space within a building as
recited in claim 1, comprising maintaining said primary liquid loop between
20 degrees centigrade and 24 degrees centigrade.
- 930 Claim 3. The method for controlling a temperature in a space within a building as
recited in claim 1, wherein said primary liquid loop and said secondary liquid
loop contain water.
- 935 Claim 4. The method for controlling a temperature in a space within a building as
recited in claim 1, wherein said first set of valves comprise a spool valve.
- 940 Claim 5. The method for controlling a temperature in a space within a building as
recited in claim 4, wherein said second set of valves are contained within said
spool valve.
- 945 Claim 6. The method for controlling a temperature in a space within a building as
recited in claim 1, further comprising providing a second fan control unit
attached to said secondary liquid loop.
- 950 Claim 7. The method for controlling a temperature in a space within a building as
recited in claim 1, further comprising unloading said compressor and
periodically cycling said first set of valves and said second set of valves
between a heating mode and a cooling mode.
- 950 Claim 8. A method for controlling a temperature in a space within a building,
comprising:
 (a) providing a fan control unit having a liquid coil and a fan, with said fan
configured to blow air over said liquid coil and into said space;
 (b) providing a microchiller including,
 (i) a compressor,
 (ii) a condenser,

- 955 (iii) an expansion valve,
 (iv) an evaporator, and
 (v) a refrigerant circulation loop configured to circulate said refrigerant from said compressor to said condenser, to said expansion valve, to said evaporator, and back to said compressor;
- 960 (c) providing a primary liquid loop running through said building;
 (d) providing a secondary liquid loop running between said microchiller and said fan control unit;
 (e) maintaining said primary liquid loop between 18 degrees centigrade and 26 degrees centigrade;
- 965 (f) when heating is needed in said space circulating liquid from said primary liquid loop through said evaporator and circulating liquid from said secondary liquid loop through said condenser; and
 (g) when heating is needed in said space circulating liquid from said secondary liquid loop through said evaporator and circulating liquid from said primary liquid loop through said condenser.
- 970
- Claim 9. The method for controlling a temperature in a space within a building as recited in claim 8, comprising maintaining said primary liquid loop between 20 degrees centigrade and 24 degrees centigrade.
- 975 Claim 10. The method for controlling a temperature in a space within a building as recited in claim 8, wherein said primary liquid loop and said secondary liquid loop contain water.
- Claim 11. The method for controlling a temperature in a space within a building as
 980 recited in claim 8, wherein said flow through said evaporator is controlled by a spool valve.
- Claim 12. The method for controlling a temperature in a space within a building as
 985 recited in claim 11, wherein said flow through said condenser is controlled by said spool valve.

- Claim 13. The method for controlling a temperature in a space within a building as recited in claim 8, further comprising providing a second fan control unit attached to said secondary liquid loop.
- 990
- Claim 14. The method for controlling a temperature in a space within a building as recited in claim 8, further comprising unloading said compressor and periodically cycling said microchiller between a heating mode and a cooling mode.
- 995
- Claim 15. A method of independently controlling a temperature within a first space in a building and a second space in said building, comprising:
- 1000
- (a) providing a first fan control unit having a first liquid coil and a first fan, with said first fan configured to blow air over said first liquid coil and into said first space;
- 1005
- (b) providing a first microchiller including,
- (i) a first compressor,
- (ii) a first condenser,
- (iii) a first expansion valve,
- (iv) a first evaporator, and
- (v) a first refrigerant circulation loop configured to circulate said refrigerant from said first compressor to said first condenser, to said first expansion valve, to said first evaporator, and back to said first compressor;
- 1010
- (c) providing a primary liquid loop running through said building;
- (d) providing a first secondary liquid loop running between said first microchiller and said first fan control unit;
- (e) providing a second fan control unit having a second liquid coil and a second fan, with said second fan configured to blow air over said second liquid coil and into said second space;
- 1015
- (f) providing a second microchiller including,
- (i) a second compressor,

- 1020 (ii) a second condenser,
 (iii) a second expansion valve,
 (iv) a second evaporator, and
 (v) a second refrigerant circulation loop configured to circulate said refrigerant from said second compressor to said second condenser, to said second expansion valve, to said second evaporator, and back to said second compressor;
- 1025 (g) providing a second secondary liquid loop running between said second microchiller and said second fan control unit;
 (h) maintaining said primary liquid loop between 18 degrees centigrade and 26 degrees centigrade;
- 1030 (i) when heating is needed in said first space circulating liquid from said primary liquid loop through said first evaporator and circulating liquid from said first secondary liquid loop through said first condenser;
 (j) when heating is needed in said first space circulating liquid from said first secondary liquid loop through said first evaporator and circulating liquid from said primary liquid loop through said first condenser;
- 1035 (k) when heating is needed in said second space circulating liquid from said primary liquid loop through said second evaporator and circulating liquid from said second secondary liquid loop through said second condenser; and
 (l) when heating is needed in said second space circulating liquid from said second secondary liquid loop through said second evaporator and
- 1040 circulating liquid from said primary liquid loop through said second condenser.
- Claim 16. The method for controlling a temperature in a space within a building as recited in claim 15, comprising maintaining said primary liquid loop between
 1045 20 degrees centigrade and 24 degrees centigrade.
- Claim 17. The method for controlling a temperature in a space within a building as recited in claim 15, wherein said primary liquid loop and said secondary liquid loop contain water.

1050

Claim 18. The method for controlling a temperature in a space within a building as recited in claim 15, wherein said flow through said evaporator is controlled by a spool valve.

1055

Claim 19. The method for controlling a temperature in a space within a building as recited in claim 18, wherein said flow through said condenser is controlled by said spool valve.

1060

Claim 20. The method for controlling a temperature in a space within a building as recited in claim 15, further comprising providing a second fan control unit attached to said secondary liquid loop.

1065

1070

1075

1080